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INTERSTATE MIGRATION OF TUBERCULOUS PERSONS.

ITS BEARING ON THE PUBLIC HEALTH, WITH SPECIAL REFERENCE TO THE STATES OF TEXAS AND NEW MEXICO.[1]

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The Effect of the Migration of Tuberculous Persons Upon the Health of Communities.

No subject is of greater moment than the one we are about to consider. If the coming of thousands into the arid region of the Southwest has had an appreciable effect upon the health of the residents of that section the fact should be known, and it at once constitutes good and sufficient reasons for the institution of strong restrictive measures. How dangerous is the consumptive, and what are the risks to which residents of communities patronized by the tuberculous are subjected? Are the dangers to health greater than in ordinary towns, and have the morbidity rates been affected? These are practical questions which seriously affect people in their every-day lives.

It is not our intention at this time to discuss whether or not infection is common in well-managed institutions, that question having long since been definitely settled. The statistics of Saugmann and Aufrecht seem to prove that tuberculosis specialists, nurses, and others working with the disease do not have a higher morbidity rate than ordinary people.

Conditions in the open resorts are vastly different. It is a natural assumption that they have proportionately the largest number of people actually excreting bacilli, and they should show, other considerations being equal, the highest morbidity rate from the disease. Our ideas regarding infection have changed so materially that we now believe that such a conclusion as this is unwarranted. The infection of tuberculosis and the development of the disease from a clinical standpoint are not synchronous, and years may elapse after exposure before the first manifestations show themselves; in fact some authors go so far as to state that chronic localized tuberculosis can never develop as the result of recent infection (Bushnell). To

[1] This is the third installment of this article. The second installment appeared in the Public Health Reports of Apr. 16, 1915, p. 1147.

those who may have acquired a degree of immunity in their youth, and by far the larger proportion of people are believed by some to have been so immunized, place infection does not assume the importance that it had under our old views of the disease, those who accept these theories largely rejecting the dangers, at least to adults, of house infection. For instance, "lung blocks" may not be actual sources of infection, but by exposing the inhabitants to exactly the same debilitating influences they predispose to the disease. On the other hand, a particular spot, such as an open resort, may infect, but the depressing influences, such as bad housing, unsanitary habits, etc., may be lacking, and the disease never manifest itself. Infection and development of the disease, then, are not similar terms, and the latter is what we shall be obliged to consider.

The arid region of the Southwest is one in which tuberculosis does not ordinarily thrive. This statement must be at once modified by exempting certain races—Indian and Mexican—among whom the disease shows as great a virulence as in any other section. Many explanations are offered for this apparent immunity. Early settlers are apt to be of selected stock, but quite the contrary holds true in this instance, many of these being the offspring of inferior grades. Again, newly settled districts do not at once show the results of insanitary conditions, but only after a lapse of years, and areas with a low density of population are likewise less susceptible to the invasion of disease. Overcrowding is less, industrial conditions are different, and outdoor life is more customary, all these being factors which undoubtedly exert an influence. We should recognize, then, at the start that this section does not exhibit as high a tuberculosis death rate as other districts.

The problem of determining actual conditions is complicated by the presence of a primitive people apparently peculiarly susceptible to the ravages of this disease, the Mexicans. That there is any connection between the influx of consumptives and the high tuberculosis death rate of these people is believed to be improbable, though certain physicians contend that contact with invalids is the source of their infection; however, this is a matter to be discussed later. Were they to be considered in our present figures the entire aspect of the question before us would be altered, and our conclusions necessarily would be entirely different. The death rates of the two classes will, therefore, be treated separately, and for the time being at least our facts and figures do not include the Mexicans. The presence of another supposedly susceptible racial division, the negro, in districts to the east, adds to the difficulties of our problem.

The first city to be considered is El Paso, the population of which was by the last census estimate 47,075. This city annually harbors over 4,000 consumptives. A few of this number are maintained in hospitals and sanatoria, and undoubtedly are properly instructed; others, under the care of visiting nurses or physicians, are directed

concerning prophylactic measures; but the vast majority, at least 80 per cent of the infected, use absolutely no precautionary measures. Spitting is promiscuous. Sputum cups are a great rarity, the writer never having observed one in use, and were one to be brought forth in a public place it would undoubtedly create as much excitement as in any eastern city. In the homes, coffee cans, baking-powder boxes, and other utensils are brought into use, to be thrown over into the next lot, perhaps, when filled. In the cheaper lodging houses the carpet is more often the receptacle, and there is not a boarding house in the city which has not been infected. The railway stations, street cars, stores, and other public places are daily invaded by consumptives, just as in any other open resort. All things considered, then, this should be an ideal place for the development of the disease.

In a resort of this character it is impossible to tell, either by length of residence or otherwise, whether certain persons are health seekers. People are secretive, especially in these days of prejudice, and the health belt is thronged with invalids who never have given indication of their infection. We must therefore adopt some other means than length of residence or the testimony of individuals to inform us who was or was not infected upon arrival to serve as the basis of our computations. This compels us at once to fall back upon the native-born population. Unfortunately, in a rapidly growing western town this class is extremely small, and that which is existent has not yet reached the age when tuberculosis manifests itself. However, the writer has met a number of native-born El Pasoans; therefore they do exist. Our conclusions must necessarily be based upon mortality rather than morbidity.

The following are the only deaths from tuberculosis recorded as among native-born residents of El Paso during the 10-year period beginning January 1, 1904:

Year.	Case.	Age.	Facts concerning deceased.
1904	1	1 year 5 months....	Tuberculous meningitis.
	2	7 months.....	Scrofula; no other information obtainable.
1905	3	22 years.....	Pulmonary tuberculosis; was an athlete at college in the East; mother tuberculous.
	4	2 years 8 months...	Tuberculous meningitis.
1906	5	4 years 6 months...	Negro.
	6	15 years.....	Undoubtedly negro; name and residence indicate this.
1907	7	1 year 3 months....	Tuberculous meningitis.
	8	8 months.....	Do.
1908	9	21 days.....	"Hereditary tuberculosis"; mother tuberculous.
	10	2 years 7 months...	Tuberculous meningitis.
	11	7 months.....	Do.
	12	22 years.....	Mother Mexican; spent his life in Mexican surroundings.
	13	24 years.....	Glandular enlargement about the jaw; operation, but glands returned and enlargement became general; never pulmonary symptoms.
1909	14	1 year 4 months....	Tuberculous meningitis.
	15	5 months.....	Do.
	16	23 years.....	General tuberculosis.
1910	17	22 months.....	Child was ill with an acute infectious disease; mother tuberculous.
1911	18	7 months.....	Tuberculous meningitis.
1912	19	10 months.....	Tuberculous meningitis; father tuberculous.
	20	1 year 2 months....	Tuberculous meningitis.
1913	21	1 year 3 months....	Do.

In addition to the cases cited there were 86 Mexicans who comprise the native-born residents dying of tuberculosis during the 10-year period. Of the 21 recorded cases, 12 were diagnosed as tuberculous meningitis, a disease which presents a complex clinical picture. Of the remaining 9, 2 were negroes, and 1 proved to be a half-breed Mexican. This leaves us 6 cases to be accounted for. Case 2 was diagnosed as "scrofula." Case 3 was a frank case of the pulmonary form developing in a long-distance runner while in college in New York City. Case 9 was called "hereditary tuberculosis." Case 13 was probably not tuberculosis, and no facts could be ascertained regarding Case 16. Case 17 followed an acute infectious disease and was probably a broncho-pneumonia. Of these 6 cases, then, but 2 were of the pulmonary type and the diagnosis was somewhat improbable in the remaining 4.

The Census Bureau does not give us data regarding the number of native-born residents in a given community, and we therefore can not determine the tuberculosis death rate of this particular class, but certainly the list is not especially alarming. Accepting every meningeal case as really being of tuberculous origin, knowing that tuberculous meningitis is much more apt to occur in children than in adults, and that there are hundreds of native-born children in El Paso, and realizing that we are dealing with a city whose American population has varied from 15,000 to 35,000, is not the list of 12 deaths surprisingly small? Unlike pulmonary tuberculosis, this form of the disease does not require years to manifest itself; therefore if infection were of frequent occurrence, it is reasonable to expect that at least this type would be far more common. Moreover, it should be recalled that a large percentage of the children in this city are the offspring of tuberculous parents and living in intimate contact with persons actually excreting bacilli. Surely if infection were as common as we have been led to believe, and there were not some protective influences at work, the native-born death rate would be higher than this.

In the city of Albuquerque the same procedure was followed, with this difference: At El Paso it was only possible to consider the native city-born population, the climatic influences of the remaining sections of the State differing widely from the western. In New Mexico climatic conditions are approximately the same throughout, and from whatever section residents come they have been subjected to the same influences. Therefore at Albuquerque all New Mexican-born residents were classified as native born, and in this way the field was broadened materially.

During the 10-year period ending in 1913 there were 111 deaths from tuberculosis among native-born New Mexicans at Albuquerque;

of these, 97 were of Mexican descent. The remaining cases were as follows:

Year.	Case.	Age.	Facts concerning deceased.
1904	1	9 months	Tuberculous meningitis.
1905	2	20 months	Pertussis-measles-broncho-pneumonia-tuberculosis.
1906	3	7 months	Tuberculous meningitis.
1907	4	5 months	Indian.
1908	5	3 years	Tuberculous meningitis.
	6	14 months	Do.
	7	28 years	A negress.
1910	8	2 years	Tuberculous meningitis.
1911	9	48 years	Proved to be a Mexican.
	10	26 years	A negress.
	11	2 years	Tuberculous meningitis.
1913	12	22 years	No information obtainable.
	13	30 years	Proved to be a Mexican.
	14	4 months	Tuberculous meningitis.

In the 10-year period, then, there are but 14 cases to be accounted for. Of these, 7 were meningeal, 2 were of negresses, and 2 proved to be of Mexican and 1 of Indian origin. Case 2 was an American child of 20 months which not only had whooping cough, measles, and broncho-pneumonia, but was also supposed to be tuberculous, and case 12 was a woman of 22 concerning whom no facts could be gathered.

Similar figures have been worked out for San Antonio, but the problem there is more complicated, as the city partakes of the Gulf climate and has congested districts and other conditions favoring the disease. In the 10-year period there were 121 deaths among native-born whites, which in proportion to the population is slightly higher than at El Paso or at Albuquerque. In the remaining towns of New Mexico and Texas no reliable data could be gathered owing to the incompleteness of the death returns.

Are we warranted, in face of the fact that we know so little concerning the number of native-born residents in these two cities, in drawing any conclusions from these lists? It would seem that we are. We are certain that there are several thousand native-born children in El Paso, and proportionately even more at Albuquerque. Surrounded as they are by hundreds of consumptives, living as they do in intimate contact with infection, so far as our observations go they yet remain safe. Is it not a fair deduction, then, that adults, whose susceptibility is even less than that of children, are likewise in no serious danger?

In our efforts to determine the amount of tuberculosis developing in a given city we should not confine ourselves to the native-born population. A second method adopted at El Paso is probably of greater value, and that is the direct investigation of every case succumbing to the disease to ascertain whether its development preceded arrival. If accurate case records were kept this would be a valuable method of determining the exact number of indigenous

cases, but unfortunately physicians do not as a rule keep such records, and their memories are often defective. For this reason the writer was unable to consider cases which dated back more than two years, but the method is such a useful one that it should be maintained in every resort city. It is presumed that those who have been in the community but a short time came with the disease in an active stage, but those with a longer residence, which in this instance we have placed at five years, were possibly well upon arrival. The following comprise all persons dying of tuberculosis in the city of El Paso who had a longer residence in the State than five years, the information as to the status upon arrival being obtained from physicians, undertakers, relatives, or friends.

1913.

Case.	Age in years.	Years in State.	Status upon arrival.
1	26	12	Father and two sisters tuberculous; claims to have been well upon arrival.
2	46	6	Health seeker.
3	33	6	Do.
4	54	8	Do.
5	49	5	Do.
6	21	6	Do.
7	38	18	Do.
8	29	5	No information obtainable.
9	47	15	Health seeker.
10	49	22	Do.
11	34	34	Do.
12	42	8	No information obtainable.
13	44	44	Health seeker.
14	60	13	Do.
15	27	27	Do.
16	57	6	Do.
17	27	27	Do.
18	33	33	Do.
19	39	15	No information obtainable; negro.
20	30	13	Negro roustabout and drunkard; disease possibly contracted in El Paso.
21	33	8	Health seeker.
22	42	6	Negress; drunkard and lewd woman; also syphilitic; disease possibly contracted in El Paso.
23	26	26	Health seeker.
24	27	27	Health seeker; negro.
25	33	10	Health seeker.
26	30	9	Do.
27	33	13	Do.
28	29	5	Do.
29	57	8	Do.
30	40	9	Do.
31	52	30	Physician believes he was healthy when he came; disease followed typhoid.
32	19	5	Health seeker.
33	18	18	Do.
34	43	11	Do.
35	30	6	Do.
36	31	20	Do.
37	32	32	Do.
38	31	31	Do.
39	39	10	Do.

Of those with a longer residence than five years 32 were plainly health seekers; concerning 3 no information was obtainable, and in the remaining 4 there was a possibility of the disease having been contracted in El Paso. Of the 4, case 1 was a young woman whose father and two sisters were tuberculous and whose physician was suspicious that she too had had symptoms before arrival; case 20

was a dissipated negro; case 22 was a negress, a lewd and syphilitic woman; while case 31 was a man supposed to have been healthy.

1912.

Case.	Age, in years.	Years in State.	Status upon arrival.
1	37	21	No information obtainable; negro.
2	33	8	Health seeker.
3	35	5	Do.
4	28	7	Do.
5	42	42	Do.
6	47	11	Do.
7	47	8	No information obtainable; an alcoholic.
8	44	6	Health seeker.
9	19	10	Do.
10	37	37	Do.
11	38	6	Do.
12	56	56	Do.
13	26	5	Do.
14	44	44	Do.
15	45	11	Do.
16	34	7	Do.
17	26	7	Do.
18	21	21	No information obtainable.
19	71	50	Health seeker.
20	47	5	Do.
21	25	21	Not known to have been a health seeker, but died of tuberculous meningitis; no puncture.
22	40	6	No information obtainable; a confirmed alcoholic.
23	33	26	Came to El Paso at 6; well until marriage; pulmonary and intestinal tuberculosis.
24	26	22	Health seeker.
25	22	22	Do.
26	40	8	Do.
27	24	9	Do.
28	37	37	Do.
29	47	9	Do.
30	31	31	Do.
31	35	5	Do.
32	38	12	Do.
33	19	19	Do.
34	40	6	No information obtainable.
35	43	17	Health seeker.
36	24	24	Do.
37	24	24	Do.
38	23	23	Do.
39	48	45	No information obtainable; negro.
40	41	12	Health seeker.
41	46	5	Do.
42	43	18	Do.
43	56	14	Do.
44	33	12	Half-breed Mexican.
45	38	5	Health seeker.
46	33	9	Do.
47	30	30	Do.
48	29	29	Do.
49	32	5	Do.
50	31	5	Do.
51	28	28	Do.
52	40	10	Do.
53	45	20	No information obtainable.
54	32	7	Health seeker.
55	48	14	No information obtainable.
56	30	30	Health seeker.
57	32	5	Do.
58	58	18	Chinaman and opium fiend; disease probably contracted in El Paso.
59	33	12	Health seeker.
60	13	13	Syrian; lived in Mexican quarter during lifetime.
61	44	44	No information obtainable.
62	63	14	Not known to have been a health seeker, but died of tuberculous meningitis.
63	22	22	Health seeker.

Of the 63 cases 48 were unmistakably of health seekers. No information could be gathered concerning 9, and the remaining 6 could have developed the disease after arrival. Case 21 was meningeal, but with no lumbar puncture. Case 23 came to the city when young and

her disease followed childbirth. Case 44 proved upon investigation to be a Mexican half-breed. Case 58 was a Chinaman and an opium fiend. Case 60 was a Syrian, but without Mexican blood, who had lived in the Mexican district, and case 62 died from meningitis.

Summarizing, we have for the two-year period a list of 102 people, with a longer residence in the State than five years, dying of tuberculosis. Of these, 80 were health seekers; of 12 no information could be gathered, and the remaining 10 could have developed the disease in El Paso, but in almost every instance there were sufficient reasons, either in race, habits, or manner of life for the onset of the infection.

Let us combine our figures of the native-born population and those with a longer residence than five years. The population of El Paso is over 47,000. It is, we think, a reasonable conclusion that even in this rapidly growing western city 10,000 of this number are either native-born white Americans, not of Mexican descent, or people who have resided in the State for a period of five years; certainly no resident of El Paso will take exception to this estimate. Now, the tuberculosis death rate in the registration area in 1912 was 1.495 per 1,000, the lowest ever recorded; therefore in this two-year period there should have been just 30 deaths from the disease among this group of 10,000 citizens. What was the number—for we have the figures right before us? From the record of native-born residents given further back we learn that there were 3, all meningeal infections, and from our present lists, after eliminating the negroes, Mexicans, and Chinese, we select 6, making a total of 9. That is, the rate is not even one-third as great as that of the registration area. Truly, if infection were of common occurrence the mortality rate should demonstrate the fact, and are we not safe in stating from these very figures alone that the dangers to healthy individuals in this open resort are not any greater, and are apparently considerably less, than those of an ordinary city? Counting every case not clearly proven to have been of a health seeker as having developed the disease in El Paso, without eliminating a single person of the susceptible class, and basing our computation upon the low estimate of 10,000, we still have but 25 cases, a number even below that of the registration area. Does this indicate that the residents of that city are being infected by this influx of invalids? If they are, they seem not to have suffered seriously therefrom.

As we return to Albuquerque let us adopt a third method of determining the degree of danger in the resort cities. The tuberculosis death rate at all times bears a certain definite relation to the general death rate, although the decrease in the former has not kept pace with that of the latter, a fact which should be recalled whenever we manifest a tendency to congratulate ourselves upon our

successful warfare against the disease. In 1912 the general rate was 13.9 per thousand, while the tuberculosis rate was 1.495 per thousand; this for the registration area. Computing the ratio it is found that for every 9.2 deaths 1 was from tuberculosis; in 1911 the ratio was 1 to 8.9; in 1910, 1 to 9.3; and in 1909, 1 to 9; averaging 1 to 9.1 for the four-year period. Now, if conditions are such as to favor the development of tuberculosis it is reasonable to suppose that not only will this ratio be maintained, but that it will actually be exceeded, the second figure in our ratio falling as the number of tuberculosis deaths increases. Moreover this should be true of any particular class of citizens, either native born, or others.

Once again we are obliged to fall back upon our native-born population. In the two cities of El Paso and San Antonio the native-born population is mostly composed of the young, among whom the tuberculosis rate is exceedingly low and the general rate, owing to infants, high; it would therefore be manifestly unfair to base deductions upon the ratio in these two cities. But at Albuquerque conditions differ. Here are a people, the Mexicans, who have lived in that city for over two hundred years, and the native-born young are less out of proportion. Therefore it would seem that this class, together with the native-born Americans, would, if the development of the disease was influenced by the presence in the city of hundreds of consumptives, show a higher ratio. For the 10-year period the deaths among native-born New Mexicans at Albuquerque were as follows:

	Tuberculosis deaths.	Deaths from all causes.		Tuberculosis deaths.	Deaths from all causes.
1904	11	96	1910	16	129
1905	10	93	1911	9	129
1906	13	92	1912	11	110
1907	5	103	1913	13	110
1908	12	124			
1909	11	134		111	1,120

This gives us a ratio of 1 to 10.1; in other words, for every 10.1 deaths there was but 1 due to tuberculosis, whereas in the registration area there was 1 out of every 9.1. This, too, among a people largely composed of a class prone to the disease, and where bad housing and insanitary living conditions are common. After making all corrections for age, because necessarily we have counted the young native-born Americans who have a somewhat high rate, does it not seem probable that if the danger of contagion were great this ratio would be vastly different? It proves to be even a much better showing than that of the registration area.

At this point some one may claim that deaths from the disease are rare, recovery ensuing immediately after the development of the

infection, the climatic conditions being such as to favor this course, and that the mortality statistics lead to erroneous conclusions. This is quite the opposite from the truth, for physicians are fairly well agreed that those cases, the initial symptoms of which are manifested in this climate, are apt to be unfavorable as to prognosis. Morbidity statistics are of course more reliable than mortality figures, but unfortunately there are none to be found. In going from place to place the writer visited the majority of physicians, making it a point in every instance to ascertain the number of cases of indigenous tuberculosis which each had observed, the question usually being put in this manner: "How many cases of tuberculosis have you observed, in people other than Mexicans, in which you were of the opinion that the disease developed in this section?" The majority of physicians could not bring to mind such an instance, but occasionally one would recall a patient of this character, at the same time calling upon his colleagues, if such were present, to substantiate the statement. Think of physicians who have practiced many years in a community without ever having observed a case of tuberculosis developing there!

In 1908 Brown made a similar canvas of all the physicians in El Paso engaged in general practice, basing the figures upon mortality. The dean of the profession had been in active work for 27 years, 18 had been residents for over 10 years, and the average of all was 7½ years. Each physician was asked how many deaths he had had in white people, other than Mexicans, from indigenous tuberculosis. Sixty-two physicians responded, and the total number of deaths recorded was 9. And this in a city harboring hundreds of consumptives.

At Colorado Springs Gardiner has for many years kept an accurate record of every case of indigenous tuberculosis. During the last 18 years there have been but 18 cases. Baldwin has shown that even at Saranac, where climatic conditions are entirely different, the disease is far less common than in ordinary communities, and Bonney states that indigenous tuberculosis is rare in Denver, though slightly on the increase.

Several other aspects of the question present themselves. In the East it is not infrequent to observe the development of secondary cases following the onset of the disease in some member of the household. We formerly attributed this to direct infection, though some are raising their voices in contradiction of this at present. Physicians are agreed that in the Southwest secondary cases are of extreme rarity, and that persons who arrive at a resort healthy, although accompanied by a tuberculous member of the family, are quite certain to remain healthy.

Tuberculosis among cattle is also rarer in the Southwest. Range cattle are never infected, but dairy herds, being more confined, are subject to the disease. In 1911 the United States Bureau of Animal Industry tested all dairy cattle in towns of over 500 in New Mexico, finding about 2 per cent infected—a much smaller proportion than in the East. Among native dairy cattle the disease is extremely rare, and is even said not to exist, but here we meet the same difficulty as with human beings—there is very little native stock. Glanders, an infection somewhat similar to tuberculosis, appears to be greatly modified in this region. The disease is far less acute, more difficult to diagnose, easier to eradicate, and secondary cases are less apt to occur.

From the facts presented, what conclusions are we warranted in making regarding the dangers of tuberculosis in the Southwest, and how are the health problems of communities affected by this enormous influx of consumptives? The evidence based upon deaths among the native-born population may be considered of the least value in this particular section, but it remains the ideal method of determining this question, especially in view of our recent knowledge that development ensues years after infection. In such a State as Colorado this method is applicable at present, and 15 years from now will be of far greater value in western Texas and New Mexico, for by that time these States will have many native-born citizens.

The ratio of tuberculosis deaths to deaths from all causes among the native-born residents as determined at Albuquerque, is perhaps next in value. With a population largely composed of a people with a low racial immunity, living unsanitary lives, in a city where a sixth or seventh of the residents are tuberculous, we would expect our ratio to be modified. The main argument against this is that as the tuberculosis rate increases the general rate does likewise—a corollary of what has been observed for years, that as we lower our general death rate by improving hygienic conditions we decrease the tuberculosis rate as well. Therefore this may not constitute altogether sufficient proof of what it was intended to show.

The third method, that of ascertaining whether the disease was already developed upon arrival, is more reliable, but in order to be of most worth the facts should be gathered at the time of death. Such a record is well worth keeping in any resort city, as Gardiner has so ably done at Colorado Springs, and it will go far toward refuting the charge that such cities are hotbeds of infection.

More impressive than any figures presented is the testimony of physicians. When men who have been busy practitioners in a locality for half a lifetime admit that they can count on the fingers of one hand every case of tuberculosis indigenous to their section, we

must acknowledge that such statements are not without worth. While none of these men argue that the disease does not occur, they are all agreed that it is of extreme rarity and that when cases do develop there is a well-defined cause, such as bad housing, improper living conditions, alcoholism, or like debilitating influences.

So far, then, as affecting the health of communities is concerned, this influx of consumptives has had no appreciable effect, and there is not the slightest evidence to show that the hazards of residence in the resort towns studied are a whit greater than in any other community. Quite the contrary in fact is the case, for not only have these towns always had a notoriously low death rate from tuberculosis, a rate which has not in the least been disturbed, but the coming of these very invalids has set a standard of living to be emulated by all, and, as at Saranac, this has served indirectly to still lower that rate. On theoretical grounds the resort towns may be considered hotbeds of infection, but practically they are not so. If our old theories were correct, how could we explain this inconsistency, and does not the very fact that the development of the disease is not more frequent sustain in part our newer ideas regarding infection?

Whether infection in children is more common than in other situations is a different matter and one which will require a long series of post-mortem examinations and clinical tests to settle. Sensitization in the young is a necessary prophylactic measure; without it we would all be lost, but the question may arise whether the doses they receive are not excessive. We are led to believe, however, that infection is less dependent upon the number of bacilli received than upon their pathogenic qualities and the individual resistance. The question assumes a somewhat different aspect with the young than with adults—that is, as far as theory is concerned—but there is not the slightest evidence to show that their nondeveloped immunity has increased the dangers to which they are subjected.

Conjectures as to what restraining influences are at work in the arid region and what factors are responsible for the very limited amount of indigenous tuberculosis have been common. We have already mentioned several conditions, but others are of moment. It is a well-recognized fact that as altitude increases the tuberculosis rate decreases, and some physicians attribute the decrease solely to this cause, differing, however, as to whether such action is exercised through the blood by increasing the erythrocytes and hemoglobin or whether it is a mechanical effect upon the lungs, causing increased respiration, the better use of the alveoli, and improved circulation. Sunshine, the greatest enemy of the tubercle bacillus, must certainly act as a deterrent. We know that the viability of bacilli is affected by a few minutes of direct exposure and that absence of sunshine is a potent factor in house infection. It is a natural conclusion, then,

that a country possessed of the maximum possible amount of sunshine should, other conditions being equal, have a low morbidity, and most observers attach considerable importance to this factor. Some one has suggested that in time the tubercle bacillus may produce a strain much more resistant to actinic rays, and this is indeed a possibility. Absence of moisture is advanced as another cause, but the difference in relative humidity is so little that it is a fair conclusion that bacilli could long since have produced a strain easily adapted to the slightly changed conditions.

While this western country has long been noted as a sanatorium its use as a preventatorium has never received the attention it deserved. It is, indeed, a haven of refuge for the sick, but it should be even more a sheltering place for the well. With our finer methods of diagnosis it is possible for physicians to select those whose susceptibility to tuberculosis is great, and such cases should be referred to this arid region. Already there are instances of frail men gaining in strength after an outdoor life in this section, and returning to the East with many years of usefulness ahead. Members of families which have been decimated by disease have also found this arid belt a place of refuge and a few such have migrated, but the practice is not as extensive as it should be.

Do the facts presented indicate that all of our precautionary measures are unnecessary? Certainly not. The tubercle bacillus remains man's most bitter enemy, an invading host upon which we should wage constant warfare. The first great advance in the control of this dread disease followed the discovery of the bacillus; the next will be the direct result of determining how and why and when infection occurs. We have passed from darkness to the twilight zone of knowledge, but until we come into the full clear light of day the measures we adopt for our protection should include the destruction of this most powerful foe.

Tuberculosis among the Mexicans.

No paper of this character would be complete without some mention of the terrible ravages of tuberculosis among our Mexican population. Whoever is familiar with the situation can not but be impressed with the fearful toll which disease exacts from these primitive people, and their utter helplessness before the onslaughts of this infection. Living as they do in a region which is inimical to the development of this scourge, where climatic conditions are conducive to sanitary living, and where there is little excuse for improper housing, the spectacle is all the more striking.

The Mexican population in the Southwest is composed of two elements. The first are descendants of the early Spanish settlers, the original inhabitants of that territory, and of those who came into

the section years ago. These people have intermarried to some extent with the Indians, but all are native-born residents, with a standard of living much superior to that of recent arrivals. The second element are the Mexicans proper—those who have recently emigrated from Mexico. They are thickly settled along the border, particularly in San Antonio and El Paso, and each year are reaching farther north, some being found in the harvest season in Oklahoma and Kansas. These people are of the peon class, with a large and recent admixture of Indian blood, and a standard of living extremely low. They are intensely ignorant, miserably poor, and altogether a much more primitive people than the first class mentioned.

Thirty years ago tuberculosis was a somewhat uncommon disease among the Mexican population, the older physicians of the Southwest all testifying to this fact. A very careful observer who returned to Chihuahua, the field of his early practice, after an absence of many years, was particularly impressed with the change, and every practitioner refers to the great prevalence of the disease at present in a region where native Americans seem unaffected.

Owing to the incompleteness of the returns, the tuberculosis death rate among the Mexican population of Texas or New Mexico can not be computed. In the two cities, San Antonio and El Paso, which harbor the greatest number, it would apparently be easy to determine what the rate has been, but since 1910 these cities have sheltered hundreds of refugees, which complicates the situation. Moreover, undertakers and physicians, in making out certificates, are prone to record all people of Mexican descent as being of Mexican birth, the first element being indefinite, the second a known number, hence this further distorts our figures. To eliminate the error from refugees we have taken the death rate of 1909, before the influx began, basing our computation upon the census population of 1910. At San Antonio this gives us an annual death rate per 100,000 of 454.2, and at El Paso of 504.1. When it is remembered that the tuberculosis rate for the entire registration area is but 149.5, and that even the negro rate seldom exceeds 350 per 100,000, some idea may be gained of the seriousness of the situation. Based upon the 10-year record, and the Mexican-born population in 1910, the rate is even higher, 609.7 at San Antonio, and 554.5 at El Paso; therefore, allowing for all errors in death certificates, it is seen that we have a frightful mortality. It can safely be stated that none of these deaths are of health seekers, although it is possible that some few persons seek out the cities in order to receive hospital care.

There is some tendency on the part of physicians to attribute this enormous rate to infection derived from health seekers, and, as was previously stated, if this view is accepted, the mortality of the American and Mexican population being classed as one, our entire

figures relating to indigenous tuberculosis will require modification. In the opinion of the writer there is absolutely no connection between the coming of tuberculous invalids and the greatly increased prevalence of the disease among the Mexicans, although, strange to say, they were practically synchronous. The purpose of the following lines is to make this fact plain.

Probably no one contends that the high morbidity we have witnessed among negroes since the Civil War is at all dependent upon the immigration of invalid whites, neither is it believed that the Alaskan Indians, who are particularly isolated, have been so contaminated. The Kaffirs of South Africa exhibit the same tendency to tuberculosis whenever they are crowded into insufficient quarters, and this irrespective of infected whites. Reasoning by analogy, is it not then a fair conclusion that the disease among Mexicans is also independent of the coming of tuberculous invalids? If this were not so, how do we account for its presence with as great a degree of virulence in districts wholly unfrequented by consumptives? The contact between the two races is not intimate, the Mexicans usually living in a separate and distinct part of the city, and while a small number are employed as household servants and a certain amount of laundry work is performed for consumptives, yet the association is never close, being far less than that between negroes and whites. Other reasons for the prevalence of the disease stand out so much more prominently that it is useless for us to continue a search for its etiology in this direction.

The Mexicans are possessed of an extremely low racial immunity, which is probably due to the large admixture of Indian blood. Their resistance has never been developed, because they have never fought the infection through successive generations. Just as in children the susceptibility decreases as age increases, so in races the further removed they are from civilization the more susceptible they are to the disease. The type of the infection clearly proves this, for in each of the races cited the process is diffuse, identical to that witnessed in childhood. The soil is of far greater importance than the seed, and an unestablished immunity more to be considered than the presence of consumptives. If this were not so how do we account for the high mortality among the one class, the Mexicans, and practically none in the other, the Americans? Are they not exposed to the same infection, and are not the contact and association much closer among Americans and health seekers than among Mexicans and health seekers? And yet the one class escapes while the other is decimated.

The fearful ravages of tuberculosis among primitive people has long been noticed. In our own country the negro was the first to show this susceptibility; then followed the Indian, and finally the native Alaskan, but South Africans, Pacific Islanders, and others have suffered from a similar visitation. Whenever infection occurs

among people of these types it shows certain characteristics. The disease is more rapidly fatal, death occurring oftentimes within four or five months, recoveries being exceedingly rare. In the pulmonary type, cavitation is less common, the organism seemingly being unable to resist the encroachments of the disease at any point. Tuberculosis of the glands, joints, and skin, and secondary involvement of other organs, are more apt to occur, and the entire infection runs a far less chronic course than in civilized adults, and is of far greater virulence. As has been said, all this can be explained on the ground that such races have never acquired an immunity and are being visited by primary infections.

The peon class of the Mexican population responds to the infection in just this manner. Recoveries are exceedingly rare, most physicians confessing never to have seen one, and the course is almost invariably progressively downward. A person will be about his work apparently well, suffer from a hemorrhage, and in four months be dead. There is no staying hand; once the infection develops the case is practically hopeless. Cavitation does not occur to any extent, the process being extremely diffuse, and hemorrhages are common. The joint forms, as with the Indians, are frequently observed. Adenitis, as well as anæmia, is prevalent in children. Secondary cases in the same household are the rule, a record of one family being obtained in which 11 members succumbed to the disease. A widow who had had five children, in addressing a letter to the associated charities in San Antonio referred to them as "my deceased children who disappear from me, and I still have a boy I am trying to save."

The second type of Mexican, the class less contaminated by Indian blood, exhibits far more resistance to the disease. At Albuquerque the ratio of tuberculosis deaths to deaths from all causes was 1 to 10.1, an even better showing than the registration area, and this included people largely made up of this class. They are living, however, in a climate where indigenous tuberculosis in other races is almost nonexistent, and undoubtedly if they were obliged to contend with a less salubrious atmosphere, overcrowding, and altered industrial conditions their rate would be higher. Nevertheless, their susceptibility does not begin to compare with that of the others.

In looking further into the etiology of tuberculosis in the peon class one is struck by the frightful housing conditions which prevail, and these are sufficient in themselves to fully explain the high death rate recorded. When one witnesses the inadequacy of the quarters provided, the overcrowding, and the unhygienic lives that these people are forced to lead, it is not necessary to look further for the cause of their trouble and the entire problem is as an open book. Not alone is it sufficient to explain the high tuberculosis rate, but

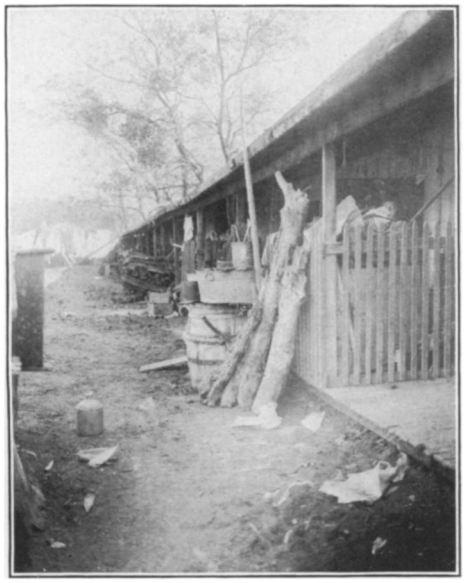

Illustration No. 1.—Mexican corral, city of San Antonio. Front view. The death rate from tuberculosis among residents of buildings of this character is 609 per 100,000, over four times that of the registration area.

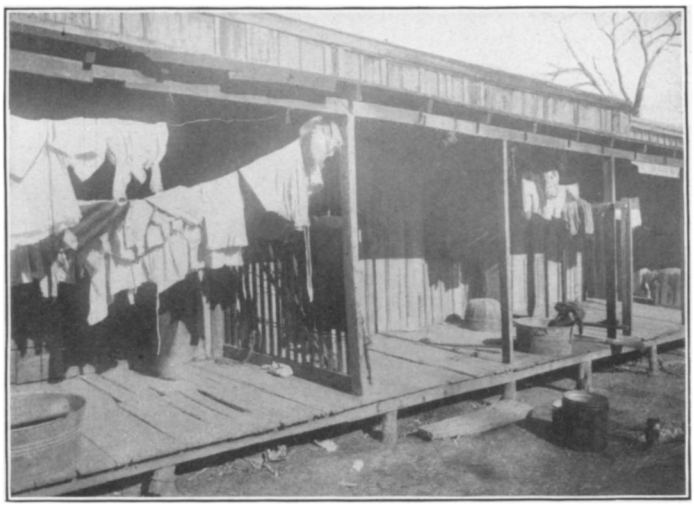

Illustration No. 2.—Mexican corral, city of San Antonio. Front view.

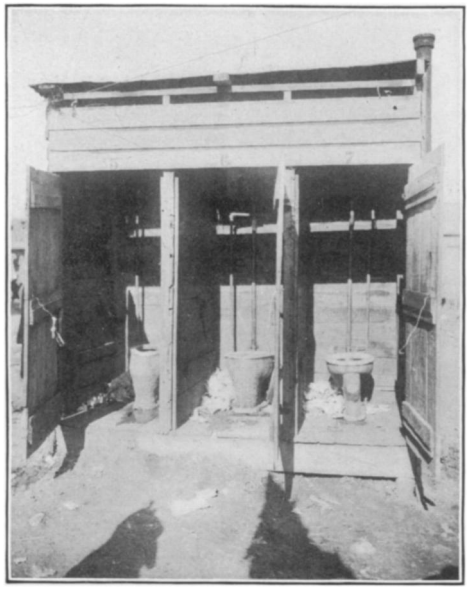

Illustration No. 3.—Toilet belonging to corral shown in illustration No. 1. These three seats, with four others, were all that were available for 86 families consisting of 336 people.

Illustration No. 4.—Tuberculous children of the corrals. The girl in the white dress is healthy, but she is a recent arrival.

the frightful infant mortality and the high mortality from pneumonia and other infectious diseases can also be accounted for.

That any city in the State of Texas, with the possible exception of Galveston, should have a housing problem on its hands is a most striking anomaly. Land is present everywhere; moreover, much of it is useless for any but building purposes, therefore it should be cheap, and with the solving of the transportation problem there is no legitimate excuse for the presence of tenements and rookeries which rival in disgusting qualities those of any eastern city and the congestion which results in buildings of this character. We more or less expect in crowded city districts such conditions as these, but that they should occur in cities of no very great population, where land values ought not to be high, is more difficult to explain.

The Mexicans in the Southwest are principally housed in two varieties of buildings—the adobe, which seldom shelters at the most more than a few families, and often not more than two, and the frame structure, or shack, which may care for 20 or more.

The adobe house is admirably suited to the Southwest. It is warm in winter, and whoever has sought the shelter of its walls can testify that it is cool in summer. Its chief objection is the absence of light and air, but there is no good reason why windows should not be as numerous and large as in other buildings, although as a matter of custom they seldom are. The dirt floors, when present, are apt to be insanitary, but in this climate, where the soil packs hard, they can be kept reasonably clean. If the house becomes dilapidated, or if the owner through an increase in his family, or for other reason, requires more extensive quarters, the structure may be torn down and reconstructed at a minimum expense. Where such a house surrounds a patio, or inclosure, and there is ample provision for light and air and no overcrowding, no reasonable objection to its use can be offered. This type of building exists in El Paso, but overcrowding and congestion are common, the ventilation is insufficient, and sunlight is barred, many of the houses being situated far below the street level. The board of health has recently condemned an entire block of this character and it is their plan to eliminate them.

The frame structures are more typical of San Antonio and are there seen at their worst, constituting a tenement-house problem rivaling that of any congested city. The "houses" are built about a central plaza and are altogether inconspicuous from the street, entrance being afforded by a narrow alley, so that their existence is unknown to those unfamiliar with the byways of those localities, this being the only desirable feature concerning them which was found. Within the plaza or compound are stables, manure, wagons, refuse, toilets, and even rows of similar buildings. The back yard

is usually absent, although in some of the corrals or barracks it does exist, that from which the illustrations were obtained possessing one which measured 31 inches in width.

The "houses" are no more than sheds of one story, and the construction is continuous, so that light and air are cut off from two sides. They are constructed from the cheapest grade of lumber and are hot in summer and cold in winter, while many of them leak. A long piazza, occupied by wood and tubs and other household utensils, is in front, and at regular intervals doors open, with a single window between, the compartments being separated by picket fences. There are usually two rooms to each dwelling, but some have but one. These measure 7 feet in height in front, sloping to 6, or even but 5, in the rear, the floor space varying. In some of the two rooms three families live, the rooms measuring 11 by 10 and 7 by 10 feet, and one shack of this size was found in which 11 people dwelt, while in another, a mere box 9 by 9 feet, there were 3. The only ventilation afforded is by a window in front, with a single sash measuring 20 by 23 inches, and one in the rear, but many of the houses were provided with only a board shutter 2 by 4 feet.

In the corral referred to, which measured 150 by 465 feet, there was provision for 96 families, 86 of the "houses" being occupied by a total of 336 people on the day of our visit, although a previous census showed 385. When it is realized that these are only one-story structures, the congestion is apparent, it being even greater than that of most city tenements, although along different lines The coming of refugees has had nothing to do with this congestion or the evil conditions, the buildings antedating that time and the surroundings, if anything, having been improved.

The toilets deserve mention. Earth closets were formerly used, but such serious complaints were entered that sewer connections were installed. There were 3 of these, all situated in the center of the compound and unshielded in any manner, with a total of 10 seats. At the time of inspection and for several days after three of these seats could not be used, the doors being nailed. Therefore there were 2 toilets containing 7 seats to be used by 336 people, 1 to every 48 persons. All of these toilets were reeking with filth, accessible to flies, and afforded not the slightest degree of privacy. Whether such conditions as these are conducive to enlightenment, health, or morals the reader may judge.

Within such tenements filth and squalor prevail. One bed is often sufficient for six or eight people, and occasionally one finds none at all. Charcoal pails are used for cooking purposes, only the well to do possessing stoves. There are no facilities for washing other than tubs and pails, the writer being able to find but three water faucets in the entire compound; this for 86 families. What encouragement is

there for keeping clean under such circumstances? The people are, of course, miserably poor. In their efforts to eke out an existence they engage every member of the family in work at home, the principal industry being the shelling of pecans, an occupation in which the very young, the aged, and the sick are employed. A bed quilt, if one is possessed, is spread in the middle of the floor or in the yard, and about this the members of the family gather, consumptives, syphilitics, and infants not being excluded. The nuts have previously been cracked by machinery, but at times this process is incomplete and the workers revert to nature's method, the teeth. The shelled product is kept on the quilt, in receptacles, or even in a corner of the room until such time as enough is accumulated to return to the factory, and it finally reaches the confectioner's window to be gazed at longingly by children of other parts. The preparation of a food product under such conditions as these may not be detrimental to health, but it certainly is not conducive to the consumption of pecans by one who has witnessed the process.

A second corral investigated was somewhat superior in that the houses were provided with attics in order to accommodate a greater number of people. The height of such attics was in no instance more than 4 feet, and yet people were supposed to sleep in such quarters, rooms in which mere boys could not stand erect. In this compound there were 60 shacks of 2 rooms each, and 3 toilets, one to every 20 families. Each of these, however, contained 2 seats, therefore there was 1 seat available for every 10 families. The investment at this place proved interesting, and as the figures came from the owner's lips they may be taken as reliable. The land was purchased seven years ago at a cost of $1,700, but its valuation is greater at present. The shacks were built out of No. 3 lumber at a total expense, which also includes the cost of labor, of $1,600, and from this investment of $3,300 the owner according to his own statement is receiving a monthly income which varies from $250 to $280. And yet we wonder why these miserable people who are forced to live in such structures have a tuberculosis death rate of 609.7 per 100,000, and attribute it to the influx of northern visitors.

The unhygienic conditions under which these people live only add to the horror. Their very attempts at healthful living are discouraged, and yet when one sees potted plants in front of these disgraceful shacks, and pictures adorning the walls, it is an indication that they long for something better. But even if they gave no evidence of caring for improved surroundings it would ill befit us to explain our own shortcomings by calling attention to theirs. They are the victims of greed, a greed which in this particular city has been unrestrained. That such frightful housing conditions should occur in one of the principal tourist cities of the country, a city which has

many natural advantages and where there is ample room for all, is all the more to be wondered at.

The accompanying photographs tell better than words that such tenements as these may breed disease and that the enormous infant mortality, the pneumonias, tuberculosis, and other infections, are but effects of well-defined causes. It is a long road from the invalid visitor to the wasted forms of these little tots whose bodies have probably never been without the limits of the corrals in which they were born, and whoever is able to trace infection over such a course must be possessed of a most vivid imagination.

If improper housing conditions and overcrowding upon which we have dwelt are insufficient to explain the prevalence of tuberculosis among the Mexicans, still further reasons may be advanced. The race is very poorly nourished, the majority of the children being thin and anemic, and many of the adults emaciated, the lack of a properly balanced ration doubtless being one of the causes of this. The people are ignorant and superstitious, the most ordinary sanitary precautions even being neglected. Syphilis has become an exceedingly common infection, and its ravages are almost as great as those of tuberculosis. These reasons, together with those which have been noted, would certainly appear to be ample to explain the high tuberculosis rate among these people and to absolve in large measure incoming consumptives from responsibility in the matter.

The Effect upon Economic Conditions.

That the coming of a large number of invalids into this thinly settled region has at least exerted some influence upon economic conditions goes without saying. Whether that influence has been deleterious or beneficial varies with the viewpoint of the indivdual, and much diversity of opinion exists. We can no more than briefly mention some of the aspects of the question.

A forced immigration is essentially harmful. While those who emigrate to the health belt do so of their own free will in response to certain inducements, it is conceivable that the movement does partake somewhat of the character of a forced immigration, in that these people search out a region where there is no demand for their presence. This being the case, it is possible that some influences may be attributed to this influx of visitors into districts which would under normal conditions accommodate a lesser number of residents. There may be, however, certain features of their coming which compensate for whatever disturbance to the business or industrial life may ensue. The Missouri Commission on Tuberculosis reported to the governor of that State that in a five-year period nearly 1,300 consumptives and 1,400 members of consumptives' families had emigrated from that State, carrying with them money and property

to the value of $1,414,200, and further added that the total loss to the State could not be estimated. If the departure of these people represented a loss to the State of Missouri it is reasonable to conclude that their coming represented a gain to some other State, although the writer must acknowledge that there is considerable difficulty in identifying the commonwealth which profited thereby, there seemingly being a reluctance on its part to come forward and make acknowledgment.

Without doubt the majority of citizens believe that the movement is harmful. This is particularly true in the larger and rapidly growing towns, communities which are in no sense dependent upon the coming of invalids, but it likewise holds true for many of the smaller settlements. Here are two towns for instance in New Mexico, approximately the same size, with business and industrial conditions identical; in the one it is believed that the interests of the community are advanced by the coming of these strangers, and every effort is made to increase the number, while in the other the movement is entirely discouraged, its chief ambition being to outgrow the reputation as a health resort it has already acquired. It is difficult to explain this diversity of opinion except on the ground that the tendency is to limit the invalid class to particular spots, the second town having decided that it is better off economically in not being a popular center.

The sex of health seekers has much to do with economic conditions. Among a thousand migrants at El Paso 71.5 per cent were males and 28.5 per cent females, this probably being about the prevailing proportion. The preponderance of males can be accounted for on the ground that they are more venturesome and have fewer home ties, but its importance is that they are made up of the working class. Some few females who migrate are also obliged to earn their living, the number of stenographers, school teachers, nurses, and others in ill health who have left their homes having increased in recent years, but for the most part these people are the wives or daughters of wage earners, or else supplied with the necessary funds.

The majority of health seekers come to the Southwest with the idea of obtaining two things, health and work, but they invariably search for the latter before they have even the slightest grasp upon the former. This very fact prevents their employment, and if they are fortunate enough to obtain it, it prevents their recovery. Therefore as far as the consumptive is concerned he will lose whichever way he steps. Work and recovery from or arrest of tuberculosis are thoroughly incompatible, and physicians will testify that those who are obliged to earn their living during the early months of their stay almost invariably decline, and this, too, irrespective of the stage

of the disease they are in. Employers are thoroughly aware of this fact, and if such help is engaged it means that within a few weeks substitutes must be found. Consequently they are reluctant to employ men of this class. Moreover, consumptives are not wanted, as fellow employees object to their presence both from an economic and health standpoint, and trade itself is often affected. The time lost through illness is another factor which has a bearing, and in these days of efficiency the output of the workman is an important consideration. We therefore see in a general way that as far as consumptives themselves are concerned conditions are not favorable for employment. Consequently they have not been as important factors economically as they would be were they recognized as desirable workmen, with keen competition on the part of employers for their labor. In order to impress this point, let us take up the various occupations as they present themselves, examining them more specifically, and ascertaining just what advantages each offers to consumptives and what effect the employment of consumptives has had.

Outdoor life for the invalid is, all other considerations being equal, to be favored; but exposure, hardships, and overexertion are quite apt to overbalance any gain so derived. The number of such positions is relatively few. The largest employers of this class of labor are the railroads, but they aim to employ only healthy men, a physical examination in most instances being required. The work is, of course, much too strenuous for consumptives, and the exposure is too great, except perhaps with gatemen or crossing flagmen. Nevertheless, quite a few invalids do gain employment from this source, particularly as clerks. The street railways offer a limited number of opportunities, but in only two cities of the States covered is there chance for employment in this line. The work is far from ideal—the dust, heat, long hours, and constant standing being decided drawbacks—the motorman's position, if anything, being preferable. For an arrested case a chauffer's position is fairly desirable, but it should be recalled that the population of the Southwest is limited. Drivers of delivery, laundry, and other wagons are subjected to too great strain, as well as to the inclement weather; hack driving, barring the long hours, is to be preferred, but for some reason consumptives are seldom so employed.

Ranch life is the ideal to which many aspire, "roughing it on a ranch" being synonymous with recovery, and yet if there is a single occupation totally unsuited to the consumptive it is this, the cemeteries being filled with people who had visions of recovering in just this manner. Not only is it theoretically wrong to put either city-bred or untrained men at an occupation of which they know nothing, but the strain is too great physically. Even with the well such a

change taxes one's endurance. Ranch life in the West is also entirely different from farm life in the East, if anything requiring sturdier and hardier men, but neither is suited to the average consumptive, even following the arrest of the disease. The western employer is aware of this fact, and he has not even a harvest season to induce him to employ an invalid. Of the lighter outdoor occupations, what opportunities are presented in the largest town of New Mexico, Albuquerque, with a population of 13,057, over 2,000 of whom are consumptives?

When it comes to indoor occupations even greater difficulties arise, for prejudice is a powerful factor here and few can gain employment unless deceitful means are used. School-teachers and others are obliged to present a certificate from a physician certifying as to health, and no prospective teacher in the East can hope to secure a position unless such certificate is forwarded with her application. Tuberculous students are also barred from the schools and colleges. Clerkships are available, but the indoor life and long hours militate against recovery, and if the subject has the appearance of being tuberculous there is little chance for lucrative work. Office employees, nurses, waiters, and servants are required to be healthy even in families where the disease is present. Manufacturing industries in the Southwest are wholly lacking and the hundred and one occupations which they provide are absent.

A great many invalids undoubtedly do receive employment, and there is probably not an occupation that has not its full quota. Your barber is a consumptive, the ticket agent is an invalid, the merchant, the butcher, the baker, and even the undertaker are all of the same family. Most of them are very careful to hide this fact, sailing under false colors; but it is necessary to be surreptitious in order to make headway. If the appearance of the consumptive is against him, he is almost sure to meet with the greatest difficulty in securing work; but if his face and body give no indication of the presence of the disease and he is willing to fabricate to a certain extent, he may in the course of time be able to secure a position in which he can earn a livelihood. Carnick very aptly summarizes the situation when he states that the most profitable employment that a febrile tuberculous patient can engage in is the methodical systematic employment of rest, and this statement can be broadened to include a vast number who are not febrile. What to do with consumptives who have sufficiently recovered to engage in light work has been a problem in the East for many years; how much more so is it a problem in the West, where work of this character is unavailable and where patients of this type are so numerous.

Coming, now, to a second aspect of the question, whether the employment of such invalids has tended to reduce the price of labor,

there is much room for a difference of opinion. Unquestionably the coming of hundreds of workers to fields where there is little call for their services, under the law of supply and demand has tended to decrease wages, but, as we have just seen, but relatively few are able to secure employment, although their labor is in the market. However, it is not the number employed, but the number seeking employment, which controls the price of labor. Just how great the decrease has been in this instance it is impossible to determine, the Mexican element, who are contenders in the cheap-labor market and who are present in large numbers in the districts covered, adding to the confusion. The following comparative table was presented by a labor leader who was not averse to saying that "between the Mexicans and lungers conditions were frightful." The figures are supposed to be accurate, but in discussing labor conditions misstatements are prone to occur. The first two are nonresort cities. The population of Dallas, Houston, and San Antonio is practically the same; that of El Paso only half as great.

	Dallas.	Houston.	San Antonio.	El Paso.
Carpenters	$4.50	$4.50	$3.60	$5.00
Typographical workers	25.00	24.00	22.00	20.00
Bricklayers [1]				
Plasterers [1]				
Plumbers	5.50	5.50	4.50	4.50
Electricians	4.00	4.00	3.50	3.50
Painters	4.00	4.00	3.60	4.00
Paper hangers	5.00	5.00	4.00	4.00
Musicians [1]				
Tailors [2]				
Sheet-metal workers	5.00	5.00	4.00	4.00
Barbers [3]				
Bartenders [3]				
Hack drivers [3]				
Brewery workers [1]				
Bookkeepers [4]				
Printing pressmen	22.00	22.00	20.00	20.00
Clerks [4]				
Unskilled labor	1.75	1.50	1.35	1.25

[1] Same throughout the State.
[2] Pieceworkers. Scale at San Antonio lowest in State.
[3] Do as well in resort cities.
[4] No fixed scale. Wages lower in the resort cities.

It will be seen that the resort cities have a somewhat lower scale. Other influences, such as organization, an oversupply of labor, or business conditions, are all of greater moment, and it is an unfair deduction that the mere presence of consumptives is responsible for this. The price of unskilled labor at Dallas is fairly high because there are relatively few Mexicans in that city; it is lower still at Houston as a result in an increase in the number, and the lowest at San Antonio and El Paso, where the number is greatest, and the presence of invalids is practically a negligible factor. At one time the wages of carpenters at El Paso were the lowest in the State, and it would have been quite natural for one to attribute this to the con-

sumptives; now they are the highest, for the simple reason that the carpenters are highly organized, there being as many invalids present as ever.

The matter of organized labor has an important bearing, and it must be admitted that it is much more difficult to unionize the members of a working class, a portion of whom consists of the invalid element, than of a class whose workers are healthy, so that indirectly the price of labor may be kept down in this manner. There is another side to this question, for in those trades already organized the consumptive is handicapped by the unions requiring that each applicant for membership shall be tested as to his fitness to perform the necessary labor, this meaning physical as well as technical ability, the union themselves being the judges. Many health seekers have recovered to a sufficient degree to be capable of doing a fair amount of work, and yet are perhaps unable to keep pace with those who are physically strong, their wages being in proportion to what they earn; however, they are debarred from membership, and consequently from remunerative employment.

In one of the cities visited the street railway employees were composed principally of consumptives, labor leaders stating that as high as 80 per cent were men of this class, and the company itself admitting that 60 per cent was not too low an estimate. The unionists were of the opinion that this class was employed in order to prevent the entire force from becoming organized and demanding a higher scale of wages, organization being difficult among men whose very lives depend upon their living in a particular section. On the other hand, the company states that in spite of an increase of wages for length of service they were losing 10 per cent of their employees monthly, and that the men now in service hold their jobs longer, are steadier, temperate, and more satisfactory in many particulars. Occasionally one is laid off on account of illness, but this disadvantage is more than compensated for by the reliability of the men. The company also states that if a man is physically able to perform his duties, and gives every indication of having the interest of the company at heart, they employ him, the fact of his being tuberculous not counting against him. A physical examination is required, but this is more to detect hernia, or other physical conditions which might lead to suits, than for any other purpose. It may be remarked here that this was the only instance the writer found in which consumptives in fair physical condition had an even chance of employment with others, and to that extent it was a pleasing circumstance, for after all we must admit that they are obliged to exist, and they require the necessaries of life to an even greater extent than healthy inhabitants. The wages on this particular line compare favorably with those of other cities, 20 cents an hour for motormen and conductors the first six

months, 21 cents the second, increasing to 25 cents the fifth year, with 10 hours of labor.

Summarizing then, we can safely say that in the skilled trades the influx of consumptives has had but little influence upon wages, this being exerted through their reluctance to organize and the fact that they are willing to work on a modified scale if the opportunity presents. In the occupations requiring no training, competition is keener and it is possible that this influence is more appreciable, but in this particular section other factors have already exerted their control, and it is impossible even for invalids to meet the competition which is present. Among the professions there are men of extraordinary ability who, for the sake of their own health, or that of some member of their family, are content to live and work in communities which otherwise could not demand their services, and it is unnecessary to state that the Southwest is the gainer thereby. This is especially true of lawyers, clergymen, and physicians, but business men and others who are invariably leaders in community life must be included. It should be remembered that tuberculosis does not always wholly incapacitate and that it chiefly affects those who are at an age period when they assume the burdens of life; hence they are seldom content, even if their financial condition justifies it, to remain idle. Admitting then that the effect of this health movement has been more than infinitesimal upon labor conditions we can readily see that compensating circumstances are also present.

Regarding the effect upon the communities themselves there should not be a great difference of opinion. There is not a town in that entire western region in which the population has not been materially increased, the business life advanced, and the growth furthered by the coming of these people. Were all the consumptives to leave, the population of El Paso would undoubtedly decrease by over 12,000, Albuquerque would dwindle to half its present size, and Silver City would become a mere spot in the desert. Admitting that the presence of an institution for the treatment of tuberculosis in the residential district of any one of these cities does decrease to a slight extent the value of real estate in the immediate neighborhood, and we are willing to acknowledge that this is the case even in a city where one-sixth of the population is tuberculous, does not the general stimulus which is given to real estate values and the increased business activities and building operations which result from the presence in a city of from 20 to 80 per cent more people than the community would otherwise have more than compensate for such disturbance? The alert business men at least believe so, and they are unwilling to interfere with this movement until their towns have reached a stage of commercial independence, however unpopular the consumptive may be, but a few residents fail to grasp

the situation, evidently believing that the only consumptives are those sprawled on the plaza benches or slowly crawling about the streets of the town. As well ask whether the great work which has brought thousands to Rochester, Minn., has been of benefit to that town as to inquire whether the coming of consumptives has promoted the prosperity of Albuquerque. There can be but one answer to such a question.

Influence of environment upon the disease.

We have considered to some extent various aspects of the health movement, but one other feature presents itself, and that is the effect of the environment upon the disease and whether success is obtained by the health-seeking class; in other words, do they find that which they seek? It is not our intention to compare the results obtained in one section of the country with those of another, or to put forth any statistical data tending to show that a certain percentage of incipient, moderately advanced, or far advanced cases should recover in this or that locality, questions of this sort being almost purely medical, and the literature of the day being already embarrassed by the quantity of data presented, but to indicate in a general way what the essentials for recovery are, whether they obtain in the open resorts, and to what extent they are secured by the average invalid. Fortunately there is but little difference of opinion among medical men regarding the principles of cure, although there may be some variance as to the relative worth of each and the proper time when they are to be applied.

The first and primary requisite is rest. Rest in a medical sense differs from ordinary rest to the same extent that surgical cleanliness differs from the cleanliness of the housewife. It is unquestionably the most important single factor in the treatment of tuberculosis and the one most often abused. Without it recovery in the majority of instances is impossible; with it all things are possible. It marks the great division between affluence and poverty, and it accounts for the view that tuberculosis among the rich is curable, while with the poor it is incurable, only because the wealthy are able to secure it under all circumstances.

Outdoor life is next in importance to rest. By this we mean continuous and uninterrupted life in the open air, and not an occasional walk down the street, sitting on the porch, or sleeping in a well ventilated room. None of these cure tuberculosis, but life in the open, with the breezes blowing about and the flood of sunshine pouring down does cure the disease. It is for this reason more than any other that physicians recommend the resorts where outdoor life is possible the greater portion of the year with the minimum amount of discomfort. Thousands of people annually seek a healthful climate and then fail to take advantage of it when it is within their reach.

The climate is out of doors, the atmosphere within being pretty much the same in one place as another.

Proper nourishment is a third requisite. By this we do not mean the taking into the stomach of an inordinate amount of food, but rather the absorption of a well-balanced ration, one which is sufficient for all needs, and yet which does not throw upon any organ an extra task in the elimination of waste. Just what constitutes a proper ration is a nice question, and one not always for the individual to settle. Gain in weight may or may not be an index, and while it usually indicates that progress is being made, and that the food is of sufficient quantity, such is not always the case. The idea which so many persons have that because it requires 5 pounds more to balance the scales they are that much nearer recovery, is sometimes totally erroneous.

Medical supervision and care should not be omitted from our list. In no other disease is expert medical treatment more necessary than in tuberculosis, a fact too seldom appreciated by the health seekers, especially those with incipient lesions. The regulation of food, digestion, elimination, and exercise, the control of fever, cough, and pain, the prevention of hemorrhage, pleurisy, and other complications, all call for extreme nicety of judgment. The closer this supervision is, and the greater the willingness of the patient to submit to direction, the better are the chances of recovery. Even without the use of a single remedy or adjunct known to medicine this oversight remains essential, and the patient, whatever stage of the disease he is in, should have a guiding hand.

Are the majority of consumptives versed in the requisites necessary to establish a cure? By no means. The average sufferer comes to the West with the sole idea that the climate will cure him, that all he needs to do is to take up his residence in that particular locality, and that nature somehow will perform a miracle. He totally ignores the value of fresh air, apparently never having heard of it; he is unfamiliar with rest in a physiological sense, and he considers that the task of his medical adviser was finished when he directed him to a more favorable climate. He therefore does not obtain the very conditions which will hasten his recovery, simply because he is entirely ignorant of them. Of the relatively few who are cared for in institutions, or those who are under the charge of competent men, this statement can not be made, but not many are of this class. This ignorance is excusable provided the patient shows a willingness to learn, but too often it is apt to continue throughout the invalid's entire residence, to his consequent loss. If every health seeker could be provided with a few months of sanatorium life immediately following his arrival, for the mere purpose of inculcating these principles, the results of climatic treatment would be far better than they are.

Even when patients are informed, there is too often a tendency to ignore the elements necessary for cure; this is inevitable. We can not expect invalids to conform to all the rules of health, but far too many of those who visit the western resorts are oblivious to even the simplest laws. The persistence with which the cure is followed varies not alone with the individual but with the resort as well. In no community in the Southwest, with the possible exception of Silver City, does one witness the enthusiasm and attention to details with which patients follow the cure at Saranac. Whoever has visited that resort carries away with him a lasting impression of the faithfulness with which nearly every sufferer pursues the object in view, even in a climate which entails at least a certain degree of uncomfortableness. While individual instances of this perseverance are common enough in the health belt, especially with those under proper supervision, as a class health seekers are apt to belittle such efforts. One may visit a resort town without discovering any evidence whatever either in the habits of the inhabitants, or their manner of life, that it is a haunt for invalids. One reason for this is that the health seeker does not desire to give any person the impression of invalidism; therefore rather than sleep out of doors he sleeps within, and in preference to a well-regulated life, one which accords with what he knows is necessary to bring about a cure, he selects the opposite. Here again, if it were possible to tag every consumptive so that each could do away with the deception under which he is living, thereby adopting a rational mode of life, our end results would be different.

It is surprising to what extent sufferers neglect to obtain medical advice and treatment. It is safe to say that not over 50 per cent of consumptives are adequately cared for, the remainder seeking treatment only when complications arise or unlooked-for developments occur. One health seeker admitted that after coming into the country his fever continued for 17 months, and yet during that time he never consulted a physician. Such neglect of one's self as this greatly diminishes the chances of recovery. Careful medical attention is fully as essential in the Southwest as in any other region, and every invalid should secure a physician in whom he has confidence and follow his advice throughout his period of residence.

It has been truly said that care without climate is preferable to climate without care, but this remark may be extended to include any one of the essentials mentioned, and if the invalid is obliged to sacrifice rest, life in the open, nourishing food, or medical treatment for the benefits which climatic change will give he has plainly grievously erred. A great proportion of health seekers can not obtain these four necessary conditions to a complete degree, but for that matter they were possibly beyond reach of the invalid before he

migrated, so that it is unsafe to say that every consumptive discovered living under imperfect or unsatisfactory conditions should have remained at home. He may have even bettered his surroundings, but certainly if he has made them no worse he has something of a chance of profiting in the end. This aspect of the question is not often considered by those who deprecate the coming of health seekers, but surely the invalids themselves reason along this line, and we are inclined at times to accept their philosophy.

A word should be added concerning the temperament of patients, for it has much to do with recovery, and should be given more important consideration when recommending treatment. As a rule men stand separation from home ties better than women. They soon adapt themselves to their surroundings, take up the new life with zeal, and are seldom bothered with homesickness. A young girl or boy accustomed to home comforts, who is separated from friends and forced to adopt a life with which there is no sympathy, can hope to secure but little benefit from the change. Those who are resourceful, determined, and unwilling to accept defeat, the very kind whom we look for to be successful in any undertaking, are the ideal migrants.

It is wholly unnecessary to call attention to the fact that the stage of the disease and the resisting powers of the individual are the two important considerations in forecasting the effects of climatic treatment. The sending of far advanced cases, or, what is just as bad, those in which the resisting forces are at the very minimum, to western resorts has been dwelt upon so largely and the warning sounded so many times that further words are superfluous. For one to expect that a mere change of surroundings and atmospheric conditions is sufficient to transform patients with rapidly disintegrating lungs, fever, and other pronounced constitutional symptoms into healthy beings is to expect a miracle. The entire question of climatic treatment hinges here. To indicate the cases which will receive benefit—for after all but a small percentage of those who are transferred are sent with the expectation of recovery, prolongation of life being the idea in view—to select such cases, we say, requires an astute mind, and even then the most brilliant men will err. The health movement, then, can never be one where mistakes and failures are absent and concerning which criticism can not be advanced, but if these errors can be reduced to a minimum and the needless suffering which has ensued diminished much good will have been accomplished.

In closing it may be asked whether it would be advisable to place restrictions upon the health-seeking movement other than those already indicated or to institute measures for its control. This is a mooted question, and one to be decided only after a broad considera-

tion of the entire subject. Two sides of the question present themselves—the public's and the patient's.

On the part of the public the most serious objections to consumptives is on the ground that they endanger the public health. Curiously, but little literature has been advanced, as far as the resorts are concerned, to prove this contention, and likewise that which has been offered to establish the opposite has been fully as scant. On a theoretical basis the public is perhaps justified in their pronouncement, but until they furnish absolute proof of the correctness of their theories, with facts and figures to substantiate them in every detail, such a radical measure as barring consumptives from given districts or the placing of any restrictions upon their coming and going should not be undertaken. We have little respect for the rights and liberties of the individual; the common good is what we must consider, and the privileges which belong to any being may be submerged if the welfare of others is at stake. Particularly is this true in matters of health, and the courts have invariably upheld such doctrine. But the erection of barriers to control the movements of diseased persons, a disease which afflicts one-seventh of all mankind, is a serious step and one not to be taken without a long look into the future. The impracticability of such action is also an argument against it.

The presence of indigents or other undesirable persons in the resorts does not of itself seem sufficient for the institution of restrictive measures, for the problem can unquestionably be settled in a far easier way than this. As yet there has been no united action in the matter, although the calling of the conference by the governor of Texas was a beginning, and it is to be expected that further discussion of the subject will result in plans whereby the resort cities will be freed, partially if not wholly, from the yoke which they are bearing, and this too without interference with the rovings of health seekers.

From a humanitarian or ethical standpoint—and this is invariably the viewpoint of myriads of consumptives—restriction is an impossible procedure. The sacrifice of the lives of thousands—and those who are familiar with the situation are well aware that such a sacrifice would be inevitable—is not to be justified without good reasons therefor. It has been clearly proved that there are hundreds who are unable to live their lives in other than an arid region, and doubtless there are many, many times that number who could be saved were they to reside in that land of sunshine. Can we by any right or reason deprive these invalids of the chance of recovery? Is not the value of their lives greater than the small expense which the presence of a few indigents has entailed? At the best we can hope to save but a very few of those who are stricken.